

WHAT IS CLAIMED IS:

1. A medical device, comprising:

a tank member of biodegradable material having a chamber capable of holding a medicament; and

5 at least one anchor member of biodegradable material extending from said tank member;

wherein said anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom.

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2. A medical device, comprising:

a plurality of tank members of biodegradable material, each of said tank members having a chamber capable of holding a medicament;

15 a connector member of biodegradable material connecting adjacent tank members;

a cap member arranged on said connector member for hermetically sealing each of said tank members; and

20 at least one anchor member of biodegradable material extending from said tank member;

wherein said anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom.

25 3. A medical device, comprising:

an anchor member of biodegradable material having a chamber capable of holding a medicament;

wherein said anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom.

4. A medical device, comprising:

a tank member of biodegradable material containing a medicament therein; and

at least one anchor member of biodegradable material extending from said tank member;

wherein said anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom.

5. A medical device, comprising:

an anchor member of biodegradable material containing a medicament; and

wherein said anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom.

6. A medical device, comprising:

an anchor member of biodegradable material having a tip tapered at one end in a longitudinal direction, and a

mass of a medicament attached at the other end;

wherein said anchor member has at least one protruding portion extending therefrom.

5 7. A medical device, comprising:

an anchor member of biodegradable material having a chamber capable of sealing a medicament injected therein;

wherein said anchor member has both ends tapered in a longitudinal direction, and has at least one protruding
10 portion extending therefrom.

8. The medical device according to either one of Claims 1 to 7,

wherein the protruding portion of said anchor member
15 has an outline of a substantial quadrangular pyramid.

9. The medical device according to either one of Claims 1 to 7,

wherein the protruding portion extends towards a
20 direction inclined to a longitudinal direction towards the tip at an obtuse angle.

10. The medical device according to either one of Claims 1 to 7,

25 wherein the biodegradable material is poly-lactic acid,

glue, starch, protein, or glucose.

11. The medical device according to Claim 1 or 2,
wherein said anchor member has a channel in fluid
5 communication with the chamber of said tank member.

12. The medical device according to Claim 1 or 2, further
comprising a plurality of said anchor members extending
from said tank member towards different directions.

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13. The medical device according to Claim 1 or 2, further
comprising a plurality of said anchor members extending
from said tank member towards same directions.

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14. The medical device according to Claim 3,
wherein the tip of said anchor member is tapered as
viewing in top plan and cross sectional views.

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15. A manufacturing process of a medical device,
comprising:

forming semiconductor oxide layers on first and second
semiconductor substrates;

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etching the semiconductor oxide layer on the first
semiconductor substrate in a tank region and a plurality of
circle regions discretely arranged so as to form a mask of

the semiconductor oxide layer;

wet etching the first semiconductor substrate with use
of the mask of the semiconductor oxide layer;

forming a semiconductor oxide layer on the first
5 semiconductor substrate exposed by the wet etching;

forming first and second thin layers of poly-lactic
acid on the semiconductor oxide layers of the first and
second semiconductor substrates, respectively;

laminating the first and second semiconductor
10 substrates so that the first and second thin layers of
poly-lactic acid are faced to each other;

etching the first and second semiconductor substrate,
while leaving the semiconductor oxide layers of the first
and second semiconductor substrates; and

15. etching the semiconductor oxide layers of the first
and second semiconductor substrates, while leaving the
first and second thin layers of poly-lactic acid.

16. A manufacturing process of a medical device,
20 comprising:

forming a semiconductor oxide layer on a semiconductor
substrate;

etching the semiconductor oxide layer on the
semiconductor substrate in a tank region and a plurality of
25 circle regions discretely arranged, except a bridge region

extending therethrough so as to form a first mask of the semiconductor oxide layer;

wet etching the semiconductor substrate with use of the first mask of the semiconductor oxide layer;

5 forming a semiconductor oxide layer on the semiconductor substrate exposed by the wet etching;

forming a thin layer of poly-lactic acid on the semiconductor oxide layer;

10 forming a thin layer of a given material on the thin layer of poly-lactic acid;

etching the thin layer of the given material in a predetermined region so as to form a second mask of the given material;

15 etching the thin layer of poly-lactic acid with use of the second mask of the given material;

etching the semiconductor oxide layer with use of the second mask of the given material;

etching the semiconductor substrate, while leaving the semiconductor oxide layer;

20 etching the thin layer of the given material, while leaving the thin layer of poly-lactic acid; and

etching the semiconductor oxide layer, while leaving the thin layer of poly-lactic acid.

25 17. A manufacturing process of a medical device,

comprising:

forming semiconductor oxide layers on first and second semiconductor substrates;

5 etching the semiconductor oxide layer on the first semiconductor substrate in a tank region and an anchor region so as to form a mask of the semiconductor oxide layer;

ion-reactive etching the first semiconductor substrate with use of the mask of the semiconductor oxide layer;

10 forming a semiconductor oxide layer on the first semiconductor substrate exposed by the ion-reactive etching;

forming first and second thin layers of poly-lactic acid on the semiconductor oxide layers of the first and
15 second semiconductor substrates, respectively;

laminating the first and second semiconductor substrates so that the first and second thin layers of poly-lactic acid are faced to each other;

20 etching the first and second semiconductor substrate, while leaving the semiconductor oxide layers of the first and second semiconductor substrates; and

etching the semiconductor oxide layers of the first and second semiconductor substrates, while leaving the first and second thin layers of poly-lactic acid.

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18. A manufacturing process of a medical device,
comprising:

forming a semiconductor oxide layer on a semiconductor
substrate;

5 etching the semiconductor oxide layer on the
semiconductor substrate in a tank region and an anchor
region so as to form a mask of the semiconductor oxide
layer;

ion-reactive etching the semiconductor substrate with
10 use of the mask of the semiconductor oxide layer so as to
form a recess on the semiconductor substrate in the tank
region and the anchor region;

filling up the recess with a given melted material and
curing the material so as to form a molding die of the
15 given material;

forming a thin layer of poly-lactic acid encompassing
the molding die;

forming an opening on the thin layer of poly-lactic
acid to expose a portion of the molding die; and

20 etching the molding die of the given material, while
leaving the thin layer of poly-lactic acid.

19. A manufacturing process of a medical device,
comprising:

25 forming a semiconductor oxide layer on a semiconductor

substrate;

etching the semiconductor oxide layer on the semiconductor substrate in an anchor region and a peripheral portion of a tank region so as to form a first
5 mask of the semiconductor oxide layer;

ion-reactive etching the semiconductor substrate with use of the first mask of the semiconductor oxide layer so as to form a recess in the anchor region and the peripheral portion of the tank region;

10 filling up the recess with a melted poly-lactic acid so as to form a thin layer of poly-lactic acid;

forming a thin layer of a given material on the thin layer of poly-lactic acid;

etching the thin layer of the given material in a
15 predetermined region so as to form a second mask of the given material;

etching the thin layer of poly-lactic acid with use of the second mask of the given material;

etching the semiconductor oxide layer with use of the
20 second mask of the given material;

etching the semiconductor substrate, while leaving the semiconductor oxide layer;

etching the second mask of the given material, while leaving the thin layer of poly-lactic acid;

25 etching the semiconductor oxide layer, while leaving

the thin layer of poly-lactic acid so as to form a structure of poly-lactic acid that includes an opening in a region corresponding to the peripheral portion of the tank region; and

5 covering the opening of the structure of poly-lactic acid by a thin layer of poly-lactic acid.

20. A manufacturing process of a medical device, comprising:

10 forming a tank member of poly-lactic acid having a chamber capable of holding a medicament;

forming an anchor member of poly-lactic acid tapered toward to a tip thereof, and said anchor member having at least one protruding portion; and

15 connecting said anchor member with said tank member.

21. A manufacturing process of a medical device, comprising:

forming first and second recesses on first and second semiconductor substrates, respectively;

filling up the first and second recesses with a given material and curing the material;

etching the first and second semiconductor substrates, while leaving the semiconductor oxide layer so as to form first and second molding dice of the given material;

filling up a die recess of the first molding die with melted poly-lactic acid;

inserting the second molding die into the die recess of the first molding die;

5 etching first and second molding dice of the given material, while leaving poly-lactic acid therebetween so as to form a plurality of tank members; and

attaching an anchor member to at least one of the tank members.

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22. A manufacturing process of a medical device, comprising:

forming first and second semiconductor oxide layers on first and second semiconductor substrates, respectively;

15 etching the first semiconductor oxide layer on the first semiconductor substrate to form a mask of the first semiconductor oxide layer;

wet etching the first semiconductor substrate with use of the mask of the first semiconductor oxide layer;

20 forming a semiconductor oxide on the first semiconductor substrate exposed by the wet etching;

forming first and second thin layers of poly-lactic acid on the semiconductor oxide layers of the first and second semiconductor substrates, respectively;

25 laminating the first and second semiconductor

substrates so that the first and second thin layers of poly-lactic acid are faced to each other;

etching the first and second semiconductor substrate, while leaving the semiconductor oxide layers of the first
5 and second semiconductor substrates; and

etching the semiconductor oxide layers of the first and second semiconductor substrates, while leaving the first and second thin layers of poly-lactic acid.

10 23. A manufacturing process of a medical device, comprising:

forming a semiconductor oxide layer on a semiconductor substrate;

15 etching the semiconductor oxide layer on the semiconductor substrate in a predetermined mask region so as to form a mask of the semiconductor oxide layer;

wet etching the semiconductor substrate with use of the mask of the semiconductor oxide layer so as to form a recess in the predetermined region;

20 filling up the recess with a melted give material and curing the material so as to form a molding die of the given material;

forming a thin layer of poly-lactic acid encompassing the molding die;

25 forming an opening on the thin layer of poly-lactic

acid to expose a portion of the molding die; and

etching the molding die of the given material, while
leaving the thin layer of poly-lactic acid.

5 24. The manufacturing process according to Claim 22 or 23,
 wherein the mask region is defined by sides inclined
 to a $\langle 100 \rangle$ orientation of the semiconductor substrate at an
 angle of substantially $(\pi/2 - \arctan(\sqrt{2}))$.

10 25 The manufacturing process according to Claim 16, 19,
 21, or 23,
 wherein the given material is aluminum.